

SYNCHRO-SYM Electric Vehicle Electric Propulsion Systems

[Best Electric Machine \(BEM\)](#) is entering the Computer-Aided-Design (CAD) phase of developing a family of electric propulsion systems for electric vehicles (EV) that is based on its patented electric motor technology called [SYNCHRO-SYM](#), which is a symmetrical wound-rotor “synchronous” doubly-fed electric motor system circuit and control architecture as only provided by the highly integrated Brushless Real Time Emulation Controller (**BRTEC**), starting with the SYNCHRO-SYM Electric Vehicle 125 (or SSEV-125) electric motor product.

The SSEV-125 specification:

- Provides an EV propulsion system with a superior operating performance specification that always includes the efficiency, weight, and dimensions of the essential electronic controller, which for SYNCHRO-SYM is the highly integrated BRTEC;
- Provides an EV propulsion system without rare-earth permanent magnets (*such as neo permanent magnets*) and their associated issues of cogging (*or torque ripple*), cost, reliability, safety, life expectancy, and pollution;
- Provides a compact, high torque density, direct drive capability to individually drive each axle (four) without the compounding complexity, loss, maintenance, reliability, and size issues of a gearbox;
- Designed for the distributed application of four independent SSEV-125s providing power to each axle for precision vector torque control, braking regeneration, and failsafe reliability upon multiple SSEV-125 failure.

The following table provides the SSEV-125 specification:

SSEV-125 PERFORMANCE SPECIFICATIONS		
		<p>1) <i>Contains No Permanent Magnets</i></p> <p>2) <i>The continuous power and peak power were performance customized for applying an individual SSEV-125 to each axle. Therefore, the continuous peak torque and power rating should actually consider performance scaling of four SSEV-125.</i></p> <p>3) <i>The high peak torque capability of SSEV-125 with four SSEV-125s per axle provides a gearless drive system without the compounding complexity, reliability, maintenance, loss, and size issues of gearboxes.</i></p>
Continuous Torque	398 N-M (293.6 ft-lb)	@ 4 L/M liquid cooling
Continuous Power	50 KW (67 hp)	
Constant-Torque Speed Range	1200 RPM	
Maximum Speed	6000 RPM	

Peak Torque	796.2 N-M (587.2 ft-lb)	<i>21 seconds of operation Without Cooling, Rotor Locked</i> <i>Continuous operation with 14.5 L/M coolant flow</i>
Peak Power	100 KW (134 hp)	
Cruising Efficiency	96%	
Motor "System" Weight	29.8 Kg (60.2 Lbs)	<i>Each SSEV-125 includes Dual BRTEC and Frame, Axle & Bearing</i>
Motor "System" Diameter	296.7 mm (11.7 inches)	<i>Each SSEV-125 includes Dual BRTEC and Frame, Axle & Bearing</i>
Motor "System" Length	120 mm (4.7 inches)	<i>Each SSEV-125 includes Dual BRTEC and Dual Frame, Axle & Bearing</i>
Motor "System" Volume	8.3 L	<i>Each SSEV-125 includes Dual BRTEC and Dual Frame, Axle & Bearing</i>
Motor "System" Power Density (Continuous)	6 KW/L	
Motor "System" Specific Power (Continuous)	1.68 KW/Kg	